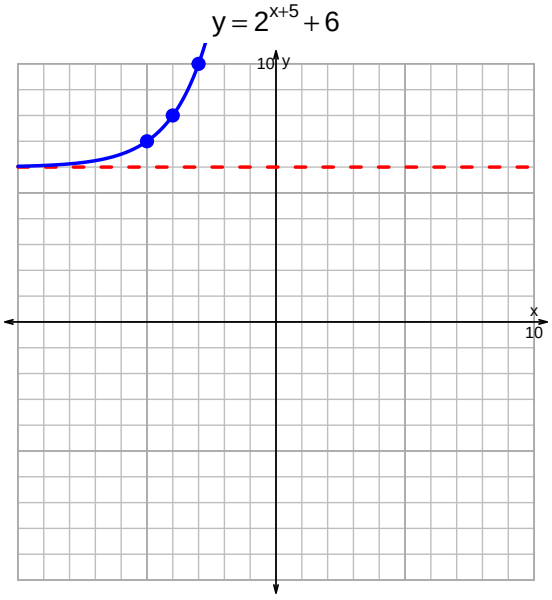
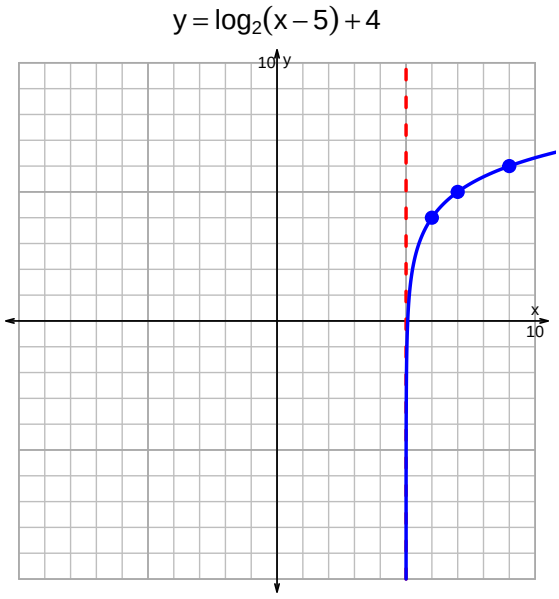
Name: Date:

s18quiz: EXP LOG (Solution v123)

1. Graph $y = 2^{x+5} + 6$ and $y = \log_2(x-5) + 4$ on the grids below. Also, draw any asymptotes with dotted lines.





2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-17 = \left(\frac{-4}{7}\right) \cdot 10^{3t/5}$$

Divide both sides by $\frac{-4}{7}$.

$$\frac{17 \cdot 7}{4} = 10^{3t/5}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{17 \cdot 7}{4}\right) = \frac{3t}{5}$$

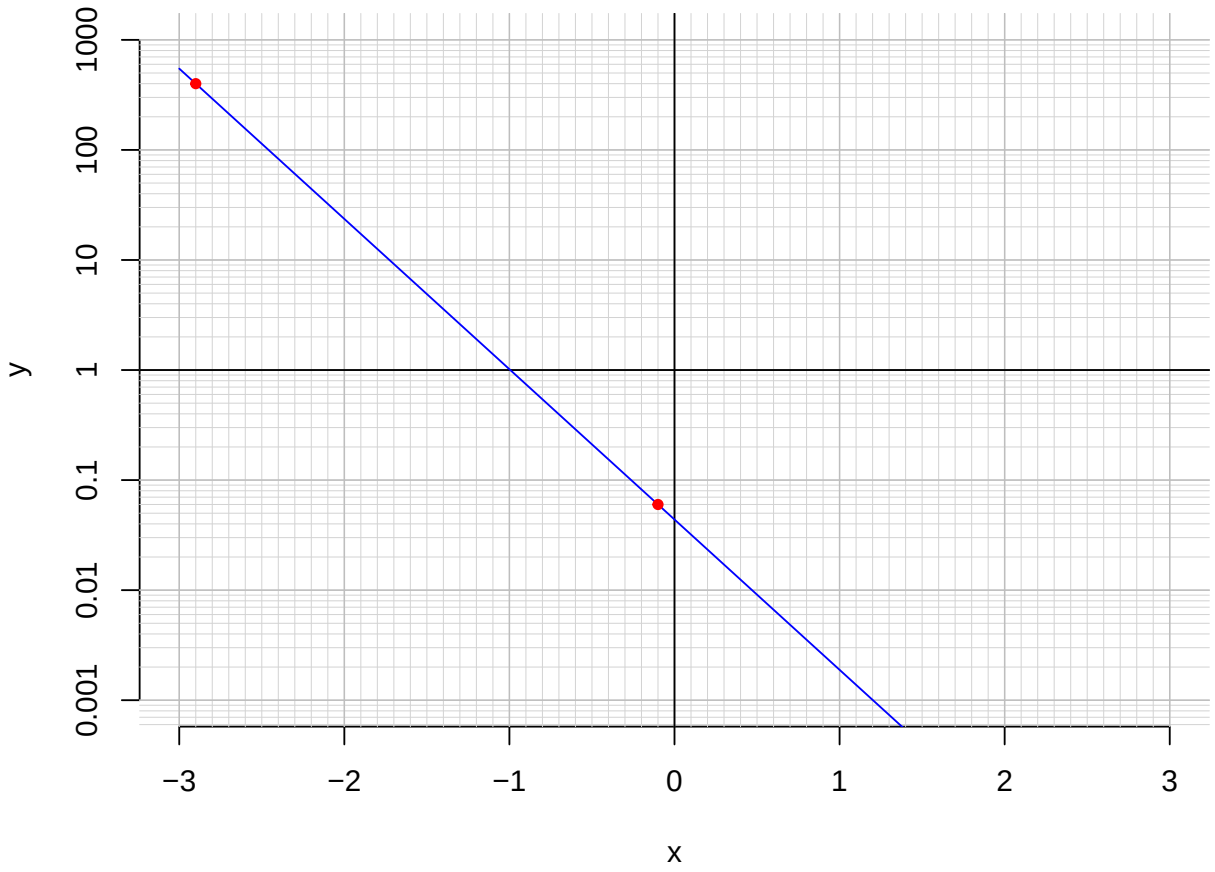
Divide both sides by $\frac{3}{5}$.

$$\frac{5}{3} \cdot \log_{10}\left(\frac{17 \cdot 7}{4}\right) = t$$

Switch sides.

$$t = \frac{5}{3} \cdot \log_{10}\left(\frac{17 \cdot 7}{4}\right)$$

3. An exponential function $f(x) = 0.0438 \cdot e^{-3.14x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-0.1)$.

$$f(-0.1) = 0.06$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{3.14} \cdot \ln\left(\frac{x}{0.0438}\right)$$

c. Using the plot above, evaluate $f^{-1}(400)$.

$$f^{-1}(400) = -2.9$$